

## ABSTRACT OF THE DISCLOSURE

A method for monitoring the mechanical condition of a reciprocating compressor having a packed-plunger cylinder is provided. An end assembly is attached to one end of the cylinder, and the strain of at least one component of the  
5 end assembly is measured as the plunger reciprocates within the cylinder. The measured strain is correlated with a crank angle to facilitate generation of a strain profile. Two pressure values related to the pressure in the cylinder are determined when the plunger is at two different locations. This facilitates generation of a cylinder pressure profile based on the correlated measured strain. The cylinder  
10 pressure profile is thus generated without the use of intrusive gauges or sensors, which may create a leak path, or create a stress concentration in the wall of the cylinder.